

Supplementary Materials

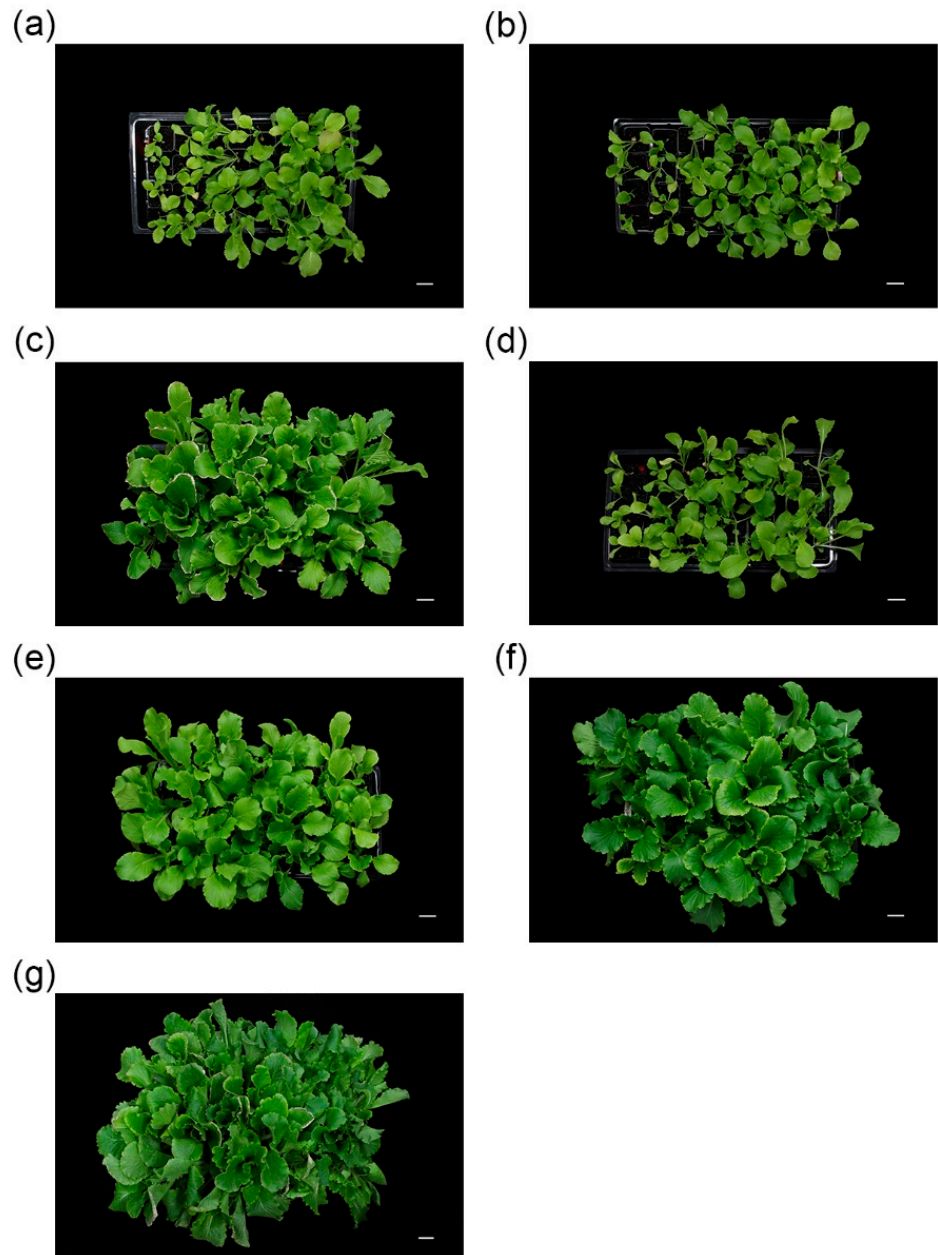


Figure S1. Clubroot resistance assay on Chinese cabbage 'Grannat' under CK (a) and treatments of plastic film covering (b), calcium cyanamide at 90 g/m² (c), chloroisobromimne cyanuric acid at 4.5 g/m² (d), dazomet at 37.5 g/m² (e), and ammonium bicarbonate at 150 g/m² (f) in greenhouse conditions (22 ± 2°C day/18 ± 2°C night, 16 h photoperiod with 300 μmol·m⁻²·s⁻¹). (g) represents a 150 g/m² ammonium bicarbonate treatment at a higher temperature (32 ± 2°C day/18 ± 2°C night, 16 h photoperiod with 300 μmol·m⁻²·s⁻¹).

Table S1. Evaluation of parameters in Chinese cabbage cultivar ‘Granaat’ under different treatments for clubroot control in greenhouse condition.

Treatment ¹	Plant Height (cm)	DSI	Copies of <i>Plasmodiophora brassicae</i> Resting Spores in Soil (g ⁻¹)	Soil pH
CK	14.63	69.08	2.13×10^7	5.67
T1	14.30	67.08	2.92×10^7	5.76
T4	18.33	24.14	1.09×10^7	7.46
T9	13.63	75.05	2.39×10^7	5.89
T14	18.74	1.52	2.67×10^5	5.65
T19	21.10	40.40	1.59×10^7	6.73
T22	20.02	1.29	1.26×10^7	6.73

¹ CK represented the group without treatment; T1, T4, T9, T14, and T19 correspond to treatments with plastic film covering, calcium cyanamide (90 g/m²), chloroisobromine cyanuric acid (4.5 g/m²), dazomet (37.5 g/m²), and ammonium bicarbonate (150 g/m²) respectively (22 ± 2°C day/18 ± 2°C night, 16 h photoperiod with 300 μmol·m⁻²·s⁻¹). T22 represents ammonium bicarbonate treatment at a higher temperature (32 ± 2°C day/18 ± 2°C night, 16 h photoperiod with 300 μmol·m⁻²·s⁻¹).

- No data available

Table S2. Measurement of root length of ‘Granaat’ in MS medium with different concentrations of NAA.

NAA Concentration (mg/L)	Root Length (cm)
0	7.76
0.04	5.01
0.08	3.52
0.12	3.14
0.16	2.79
0.20	2.60

Table S3. Disease index of 'Granaat' under different treatments for clubroot control in field conditions.

Treatment ¹	DSI	
	2020	2021
CK	51.27	50.51
T1	55.64	54.63
T2	23.53	25.08
T3	16.85	25.74
T4	17.65	12.35
T5	19.42	27.91
T6	13.63	23.78
T7	64.01	33.14
T8	67.73	28.03
T9	64.02	22.59
T10	59.67	30.03
T11	64.43	24.38
T12	18.42	3.65
T13	20.11	5.03
T14	19.41	1.31
T15	14.02	6.86
T16	4.68	2.65
T17	54.64	44.89
T18	51.41	34.16
T19	51.10	31.91
T20	52.39	29.95
T21	49.92	38.01

¹ CK represented the group without treatment; T1 was plastic film covering treatment; T2 to T6 were treated with calcium cyanamide at rates of 60, 75, 90, 105, and 120 g/m², respectively; T7 to T11 were treated with chloroisobromine cyanuric acid at rates of 1.5, 3.0, 4.5, 6.0, and 7.5 g/m², respectively; T12 to T16 received dazomet at rates of 27.5, 32.5, 37.5, 42.5, and 47.5 g/m², respectively; and T17 to T21 were treated with ammonium bicarbonate at rates of 120, 135, 150, 165, and 180 , respectively.